4.7 Environmental Justice

In consultation with the U.S. Environmental Protection Agency's (EPA) Office of Civil Rights and Environmental Justice, the National Marine Fisheries Service determined that Native American tribes were the only racial or socio-economic minorities identified as potentially affected Environmental Justice communities within the Puget Sound Action Area. EPA's Office of Civil Rights and Environmental Justice concurred that the focus of the Environmental Justice analysis should be on these tribes (personal communication with Mike Letourneau, U.S. Environmental Protection Agency, December 10, 2002). To guide the framework of Environmental Justice analysis, the EPA Office of Civil Rights and Environmental Justice has provided guidance to be used by all federal agencies conducting Environmental Justice analyses. NMFS has utilized this guidance for the Environmental Justice analysis herein. The EPA Environmental Justice guidelines offer a range of categories that might be utilized to indicate the presence or absence of Environmental Justice effects (U.S. Environmental Protection Agency 1998b). The Northwest Power Planning Council (2000) has also utilized a range of indicators to analyze human effects in a multi-cultural framework.

> Selection of indicators to appropriately represent potential impacts on tribal peoples . . . is necessarily cross-cultural. For example, while economic issues are of keen interest to Tribes due to their critical needs for jobs and improved incomes, the Tribes consider spiritual, cultural and life-style values associated with fish and wildlife of paramount importance – and these cannot be accurately represented by contemporary economic measures.
>
> Northwest Power Planning Council 2000.

Consequently, this indicator-based assessment draws topically from the range of indicator categories outlined by the US Environmental Protection Agency (1998b), from information provided in cultural and economic sections of Section 3 of this Environmental Impact Statement, and from other information relevant to the circumstances of the subject tribes. A brief discussion of each selected indicator follows.

Number of Salmon Harvested as an Indicator of Tribal Perspective of Value

Tribal spokespersons remind us that, in their culture, " . . . tribal peoples live as one with the land, the waters, and the fish and wildlife of their areas." From a tribal perspective, the value of the salmon is self-evident – and can be articulated by tribes in their own words, and on their own terms (Northwest Power Planning Council 2000). Some of this broad perspective is captured in Section 3.5 of this Environmental Impact Statement. Other tribal statements are found throughout tribal literature. The following examples are typical, but not exhaustive.

> Shellfish, all species of salmon and steelhead are what we depend on for our survival. This was a long time resource the Klallam people depended on for food. We still depend on it. . . . The water has long been a key religious asset for the Klallam people – a sacred thing, to get our strength from the food we have taken from the Sea water and the fresh water. It still is to this day.
>
> David Charles, Klallam Elder, in U.S. Minerals Management Service 1991.

> The Lummi people have historically been major producers of seafood products. Native to the cold, productive waters of Puget Sound and the North Pacific, Lummi fishermen have harvested, processed and marketed fish to others for thousands of years.
>
> Lummi Business Council, *in* U.S. Minerals Management Service 1991.

> The people acquired guardian spirits, many of whom were salt water spirits. The Salmon Spirit was particularly powerful and was the basis for many ceremonial rituals involving death and rebirth. It was felt that the Salmon's power should be recognized, and that the Salmon should be treated properly and not abused. . . . We know what the Earth and the Creator have given us to survive. We still have the same resources – and they are still providing us with a livelihood today.
>
> Ray Fryberg, Tulalip Councillor, *in* U.S. Minerals Management Service 1991.

Numbers of salmon harvested provide an indicator of the health of stocks, and represent an appropriate measure of relative harvest abundance and of tribal value. They are incorporated in this section as a value indicator that, from tribal perspective, "speaks for itself."

Cultural Viability

The U.S. Environmental Protection Agency (EPA) incorporates cultural impacts in its Exhibit 2 menu of factors that may be considered in any Environmental Justice analysis (U.S. Environmental Protection Agency 1998b). Where the "number of salmon" indicator facilitates tribal assertion of value and potential impact "in their own words," the "cultural viability" indicator is anthropologically based – and following analysis of Section 3.5 in this Environmental Impact Statement, will focus on impacts potentially affecting *cultural sustainability*, *passing on tribal knowledge to future tribal generations*, and *preservation of tribal identity*. These issues are interrelated – but taken together, are designed to carry the framework constructed in Section 3.5 through to this Environmental Justice assessment.

The information provided in Section 3.5, together with the tribal statements provided herein, identify that while salmon available to the tribes are diminished from Treaty times, the tribes continue to actively pursue salmon, depend on salmon as a key element of their present well-being, and value salmon highly for future generations. It is this contemporary relationship between the tribes and salmon that provides the baseline for the present analysis with respect to both the "number of salmon" and the "cultural viability" indicators.

Tribal Fishing Revenue

This tribal fishing indicator directly addresses economic revenue obtained by the tribes from sale of commercially-caught salmon and/or salmon eggs. Tribes also receive economic revenue from processing salmon, and from service activity associated with commercial and sport fishing. Such additional revenues are significant for some tribes, less so for others. However, in this assessment, comparison of direct revenues from sale of tribal catch serves as an accurate and sufficient measure to identify revenue-based Environmental Justice concerns associated with the four chinook salmon management alternatives.

Actual tribal revenues from salmon harvests vary from year to year due to changes in abundance and price. Table 4.7-1 provides information on recent revenues within the Puget Sound Action Area for the 17 fishing tribes included in this Environmental Impact Statement.

Table 4.7-1. Tribal salmon fishing revenue for the action area – 17 fishing tribes (estimates in thousands of dollars).

Species	1999 Revenue	2000 Revenue	2001 Revenue
Chinook	716	636	663
Chum	325	388	248
Pink	28	1	126
Coho	350	1,031	577
Sockeye	146	2,033	133
Steelhead	10	15	2
Salmon Egg Sales	303	746	1,807
Total – All Salmon	1,878	4,849	3,556

Source: Northwest Indian Fisheries Commission, February 2003.

Finally, this section addresses three indicators common to both tribal and non-tribal assessment of human effects: per capita income, level of poverty, and relative health/mortality. Available data will not necessarily sustain a quantitative calculation of precise effects linkages between salmon harvest under each alternative and impacts on these three indicators. However, information is sufficient to apply an ordinal measure of change to each indicator, where differences in tribal access/harvest between alternatives are deemed to be significant.

Annual Per Capita Income

This indicator is based on U.S. Bureau of the Census data published from Census 2000 for *American Indians and Alaska Natives* resident *on or near* each designated reservation. U.S. Census data is commonly relied on as a "best available" objective data source. (The data reported here include some

Native Americans resident on or near designated reservations who are not members of the 17 treaty fishing tribes.)

Percent Below Poverty Level

Data for this indicator come from the same U.S. Census 2000 source as per capita income. The data indicate the percentage of *American Indians and Alaska Natives* resident *on or near* each designated reservation with annual income below the federal poverty level.

Present populations and selected circumstances for the subject fishing tribes, as reported in the Census 2000 report, are presented in Table 4.7-2. Figures for all residents of the State of Washington are included for comparative purposes. Per capita and poverty data are for 1999. Data for the Jamestown S'Klallam Tribe are based on a sample size of 5 persons, and have not been relied upon. Actual circumstances at Jamestown S'Klallam have been reported to be within the range indicated for other tribes (Meyer 1993).

Table 4.7-2. Selected data for potentially affected tribes.

Tribe/State	Native Population	Per Capita Income	% below Poverty
Makah	1,076	$9,835	31
Lower Elwha	256	8,082	33
Jamestown	5	–	–
Port Gamble	461	8,539	18
Suquamish	503	13,613	13
Skokomish	518	8,500	32
Squaxin Island	325	8,698	33
Nisqually	314	11,072	18
Puyallup	1,386	12,439	26
Muckleshoot	1,029	9,914	29
Tulalip	1,875	10,623	29
Stillaguamish	78	7,609	13
Swinomish	611	8,712	36
Upper Skagit	139	5,523	60
Sauk Suiattle	41	8,127	5
Lummi	2,208	10,142	28
Nooksack	348	9,695	29
Washington State		$22,973	11

Source: U.S. Bureau of the Census. Census 2000, Summary File 3, Tables P6, P82, P157C and P159C.

Health and Mortality

The general health status of tribal peoples in Washington State, including within the Puget Sound Action Area considered here, were described in two 1992–1993 publications as "very poor" (Washington State Department of Health 1992), and "alarmingly poor" (American Indian Health Care Association 1993). The 1999 update to the *American Indian Health Care Delivery Plan* in Washington State confirms the conclusions from these earlier studies.

> AI/AN (American Indians/Alaska Natives) have a higher burden of serious disease, premature death, and poor birth outcomes than the population as a whole.
>
> American Indian Health Commission for Washington State and Washington State Department of Health (2001) (C-3).

> Since 1980, the total reported age-adjusted death rate for AI/AN in Washington State has consistently been higher than the death rate for the entire population of the State. . . . The general trend for overall AI/AN age-adjusted death rates since 1980 has been downward, but the gap between the AI/AN death rate and that for the general population has not narrowed appreciably.
>
> American Indian Health Commission for Washington State and Washington State Department of Health (2001) (C-7).

Recent work in the Pacific Northwest has identified a linkage between salmon resources and tribal health (i.e., Trafzer 1997; and Meyer Resources 1999). Commentary from a nurse from a neighbor salmon fishing tribe offers insight into relationships between salmon and tribal health.

> My specialty is psychosocial nursing. From my perspective, everything is tied together. Nothing is separate. The health of the kids is impacted every day. We see kids come in who are grossly overweight, and they're laying the groundwork for diabetes to come. The impact of the loss of the salmon, and the loss of the traditional grounds – the loss of the time with the elders to learn the ways and to feel as if they're part of this community, instead of feeling alienated not only from their neighbors and their families but also from the bigger community of humans – has a devastating effect on the kids. I have moms come in here eighteen years old who have been pregnant two or three times, who use substances and who don't teach their children the old ways because they don't know them. They don't feed their kids the old foods because they don't have any idea what they were. So the loss of the food and the salmon is monumental – and it is all tied together. . . . If you lose your foods, you lose part of your culture – and it has a devastating effect on the psyche. You also lose the social interaction. When we can fish, we spend time together – you share all the things that impact your life – and you plan together for the next year. Salmon is more important than just food.
>
> In sum, there's a huge connection between salmon and tribal health. Restoring salmon becomes a way of life. It restores physical activity. It restores mental health. It improves nutrition and thus restores physical health. It restores a traditional food source. It allows families to share time together and build connections between family members. It passes on traditions that are being lost.
>
> Chris Walsh, Yakama psycho-social nurse, *in* Meyer Resources 1999 (page 141).

While precise cause and effect quantification remains unspecified, it can be concluded that for the fish-eating tribes that are the subject of this analysis, salmon has played, and continues to play an important role in the health of tribal peoples – and consequently, is also a likely explanatory variable respecting observable differences in age-adjusted mortality between tribal peoples and residents of the State of Washington in general (Table 4.7-3).

Table 4.7-3. Relative mortality for tribal peoples compared to residents of Washington State.

Tribal Health Service, by Counties	Ratio of Tribal Mortality to Mortality for Residents of Washington State
Clallam	1.7
Skagit, Whatcom	1.7
King, Kitsap, Mason, Snohomish, Thurston	1.3
Pierce	0.7
Jefferson, Grays Harbor, Pacific	1.0

Source: Portland Area Indian Health Care Service 1994.

These data compare number of deaths per 100,000 population for American Indians/Alaska Natives against similar data for Washington State residents as a whole. Age-adjustment eliminates the impact

of differences in age structure between the two populations, and allows for comparisons of death rates as though there were no age differences between populations (Portland Area Indian Health Care Service 1994).

As discussed in Subsection 4.2, four different scenarios of abundance and Canadian/Alaskan fisheries harvest were considered in this Environmental Impact Statement (Scenarios A through D). Considering the likelihood attributed to various assumptions by the Interdisciplinary Team, Scenario B (high abundance and maximum Canadian/Alaskan fisheries) is considered most likely, followed by Scenario A (high abundance and Canadian/Alaskan fisheries similar to those in 2003). Scenarios C (30% reduction in abundance and fisheries similar to those in 2003), and D (30% reduction in abundance and maximum Canadian/Alaskan fisheries) provide a basis for lower-bound sensitivity adjustments related to adverse exogenous events. In this section, discussion focuses on comparison of estimated tribal harvests for the four alternatives under Scenario B. Results from employing Scenarios A, C, or D are discussed following the discussion of Scenario B for each alternative. Although the catch and revenue results differ among scenarios, comparison of alternatives illustrated by Scenario B as well as the Environmental Justice conclusions reached in Table 4.7-13, are the same across scenarios.

4.7.1. Alternative 1 – Proposed Action/Status Quo

Alternative 1 would maintain present harvest opportunities and distribute catch broadly between areas and dependent tribes – supporting the existing array of economic, material, and cultural activities and values discussed here and in other report sections. Of the four alternative management regimes evaluated under Scenario B, Alternative 1 is estimated to provide approximately 4.5 times more salmon to the tribes than Alternative 2 (following), 6.5 times more salmon than Alternative 3, and 49 times more salmon than Alternative 4. Alternative 1 is projected to leave present tribal circumstance essentially unchanged – and consequently, is not estimated to generate either positive or adverse cultural, material, or health impacts for the tribes, measured from the present baseline.

Scenario B (High Abundance and Maximum Canadian/Alaskan Fisheries)

Integrating information on average fish size and prices developed from Washington Department of Fish and Wildlife (2002) with projected harvest impact under Scenario B (Appendix B), estimated tribal harvest and associated fishermen revenues under Alternative 1 are identified in Tables 4.7-4 and 4.7-5.

Table 4.7-4. Estimated tribal salmon harvested annually under Alternative 1, Scenario B.

Areas	Chinook	Coho	Sockeye	Pink	Chum	Steelhead
Juan de Fuca Strait	2,363	23,879	26,419	1,374	10,450	739
North Puget Sound	29,238	101,652	255,859	731,587	152,189	532
South Puget Sound	33,241	140,279	47,700	316	196,350	663
Hood Canal	15,311	17,015	0	28,602	107,433	0
Full Action Area	80,153	282,825	329,978	761,879	466,422	1,934
Full Action Area – All Species						1,923,191

Under Alternative 1, Scenario B, an estimated 80,000 chinook, 283,000 coho, 330,000 sockeye, 762,000 pink salmon, 466,000 chum salmon, and almost 2,000 steelhead would be taken by the tribes annually. Applying average fish size and prices developed by the Washington Department of Fish and Wildlife (2002) to these numbers, Alternative 1, Scenario B, would generate an estimated $5.1 million in annual direct revenue for tribal fishermen.

Table 4.7-5. Estimated annual tribal salmon revenue, by species – Alternative 1, Scenario B.

Species	Estimated Annual Revenue (dollars)
Chinook	750,883
Coho	716,548
Sockeye	2,083,397
Pinks	494,615
Chums	1,076,968
Steelhead	9,516
All Species	$5,131,930

Commercial revenue estimates in Table 4.7-5 and for other alternatives may be underestimated to the extent that chum catch is diverted to higher-value egg sales.

These estimates maintain present harvest opportunities and distribute catch broadly between areas and dependent tribes – supporting the existing array of economic, material and cultural activities and values discussed here and in other EIS sections.

Of the four alternative management regimes evaluated under Scenario B, Alternative 1 is estimated to provide approximately 4.5 times more salmon to the tribes than Alternative 2 (discussed below), 6.5 times more salmon than Alternative 3, and 49 times more salmon than Alternative 4. Alternative 1 is projected to leave present tribal circumstance essentially unchanged – and consequently, is not

estimated to generate either positive or adverse cultural, material, or health impacts for the tribes, measured from the present baseline.

Anticipated Environmental Justice effects are summarized in Table 4.7-13, following discussion of tribal impacts associated with each alternative.

Summary of Results for Alternative 1, Scenarios A, C, or D

Predicted tribal harvests of chinook salmon under Alternative 1, Scenarios A, C, or D are presented in Table 4.7-6.

Table 4.7.6. Predicted tribal harvests of chinook salmon under Alternative 1, Scenarios A, C, or D.

Area/Element	Scenario A	Scenario C	Scenario D
Juan de Fuca Harvest (#)	2,363	2,363	2,363
North Puget Sound (#)	31,813	22,434	20,281
South Puget Sound (#)	35,027	25,099	23,961
Hood Canal (#)	16,962	10,166	9,340
Chinook Harvest – All Areas (#)	86,165	60,062	55,945
Chinook Revenue ($)	$805,977	$575,902	$537,757
Chinook salmon: Difference from Scenario B.	+6,012 chinook +$55,094	-20,091 chinook -$174,981	-24,209 chinook -$213,126

Predicted tribal harvests for Puget Sound coho, sockeye, pink, chum, and steelhead would remain unchanged between Scenarios A, C, or D, and Scenario B (Table 4.7-6). Scenario A (high abundance and Canadian/Alaskan fisheries similar to 2003) would increase predicted tribal harvest under preferred Alternative 1 by 6,012 chinook compared with Scenario B. This represents a 7.5 percent increase in chinook harvest – and a 0.3 percent increase in tribal harvest of all species taken together. Tribal fishing revenue under Alternative 1 is predicted to increase by $55,094 (1.1 percent) – or $6 per capita. Predictably, assumption of 30 percent less harvest would decrease projected tribal harvest under Scenarios C or D significantly. Tribal harvest is predicted to decline by 25 to 30 percent and revenue by 3.4 to 4.1 percent under Scenarios C or D.

4.7.2 Alternative 2 – Escapement Goal Management at the Management Unit Level

Scenario B

Under Alternative 2, Scenario B, overall tribal chinook harvest is predicted to decline by an estimated 29,265 fish (78%), compared to Alternative 1 (Table 4.7-7). Losses would be most prevalent in North and South Puget Sound. Catch in the Strait of Juan de Fuca would be eliminated. Harvest in Hood Canal is predicted to increase by more than 4,000 chinook.

Table 4.7-7. Number of tribal salmon caught annually under Alternative 2, Scenario B.

	Chinook	Coho	Sockeye	Pink	Chum	Steelhead
Strait of Juan de Fuca	0	1,725	0	0	2	610
North Puget Sound	8,349	33,142	0	83,400	1,808	227
South Puget Sound	22,738	72,889	0	316	81,163	653
Hood Canal	19,802	4,493	0	25,792	65,813	0
Full Action Area	50,888	112,249	0	109,508	148,786	1,490
Full Action Area – All species	422,921					

Tribal coho catches are estimated to decline from an Alternative 1 catch of 24,000 fish to less than 2,000 fish in the Strait of Juan de Fuca under Alternative 2. Coho catches in North Puget Sound are predicted to decline from 102,000 to 33,000 fish. Tribal coho harvest in South Puget Sound is predicted to decline by an estimated 67,000 salmon. Estimated catches in Hood Canal are predicted to decline by 12,500 coho. Over all areas, tribal harvesters are estimated to lose 170,000 coho under Alternative 2, Scenario B, compared to Alternative 1, Scenario B.

Under Alternative 2, Scenario B, no tribal harvest of sockeye salmon would occur. Compared to Alternative 1, this would represent an estimated loss of 282,000 sockeye to North Puget Sound and Strait of Juan de Fuca tribal fishers, and a lost tribal catch of approximately 48,000 sockeye salmon in South Puget Sound.

Tribal catch of pink salmon is expected to decline by an estimated 652,000 fish under Alternative 2, Scenario B. Lost catch in the Strait of Juan de Fuca is estimated to exceed 1,000 pink salmon. In North Puget Sound, the loss of pink salmon to tribal fisherman is estimated to be 649,000. In Hood Canal, catch of pink salmon is predicted to decline by about 3,000. The South Puget Sound pink salmon fisheries would remain about the same as with Alternative 1.

Starting from the Alternative 1 baseline, tribal chum salmon harvest is predicted to decline by an estimated 318,000 fish under Alternative 2. In the Strait of Juan de Fuca and North Puget Sound, the estimated loss of chum salmon to tribal fishermen would be approximately 160,000 fish. An estimated 157,000 chum salmon would be lost from the South Puget Sound and Hood Canal tribal harvest – a decline of 52 percent.

Under Scenario B, the loss of steelhead to the tribal harvest is predicted to be 400 fish with Alternative 2, compared to Alternative 1.

Overall, Alternative 2 is predicted to provide an all-species catch of approximately 423,000 salmon to the tribes. This is predicted to result in an all-species reduction in catch of 1.5 million salmon (78%) compared to the Alternative 1 baseline.

Using average fish size and prices developed by Washington Department of Fish and Wildlife (2002), Alternative 2 is predicted to provide annual commercial direct revenue to tribal fishermen of $1,137,000 – a loss of $4 million from the Alternative 1 baseline.

Under Scenario B, the estimated impacts of Alternative 2 would greatly diminish, and in some cases eliminate, the opportunity to be a fisherman – a respected lifestyle in tribal society. Many tribal fishermen would lose their investment in boats and gear, and the tribal ability to pass on fishing knowledge to their children and grandchildren would be impaired.

Other cultural opportunities to provide salmon as food, to share or trade salmon within tribal communities, and to conduct ceremonies would be eliminated or substantially reduced for the tribes. Information provided earlier in this subsection suggests that this, in turn, could be expected to have an adverse impact on the physical, spiritual, and cultural health of tribal peoples who already experience adverse circumstances relative to residents of the State of Washington in general (Tables 4.7-2 and 4.7-3).

Alternative 2 would significantly worsen the already adverse economic and health circumstances experienced by the 17 tribes addressed in this Environmental Impact Statement, relative to residents of the State of Washington in general when compared with Alternative 1, Scenario B.

Alternative 2 stands second to Alternative 3 (described below) in terms of adversity for the tribes. However, considered alone, Alternative 2 would still generate disproportionately high and adverse human impacts across tribal groups. Given the dependence of tribes on salmon, and the unique cultural linkage between salmon and tribal peoples, these adverse impacts would resonate far more strongly among the tribes than among the non-tribal population of Washington State as a whole.

Summary of Results for Alternative 2, Scenarios A, C, or D

Predicted tribal harvests of chinook salmon under Alternative 1, Scenarios A, C, or D are presented in Table 4.7-8. Predicted tribal harvests for Puget Sound coho, sockeye, pink, chum, and steelhead would remain unchanged between Scenarios A, C, or D, and Scenario B (Table 4.7-8).

Table 4.7-8. Predicted tribal harvests of chinook salmon under Alternative 2, Scenarios A, C, or D.

Area/Element	Scenario A	Scenario C	Scenario D
Juan de Fuca Harvest (#)	0	0	0
North Puget Sound (#)	8,531	415	391
South Puget Sound (#)	24,150	11,523	10,537
Hood Canal (#)	21,213	12,745	11,608
Chinook Harvest – All Areas (#)	53,893	24,683	22,536
Chinook Revenue ($)	$445,065	$193,445	$176,619
Chinook salmon: Difference from Scenario B.	+3,005 chinook +$24,049	-26,683 chinook -$227,571	-28,351 chinook -$244,397

If Scenario A were implemented, tribal harvest would be predicted to increase under Alternative 2 by 3,005 chinook salmon compared to Scenario B. This would represent a 6.0 percent increase in chinook harvest – and a 0.2 percent increase in tribal harvest of all species taken together. Tribal fishing revenue under Alternative 1 would increase by $24,049 (0.5 percent), or $3 per capita. Predictably, assumption of 30 percent less harvest would decrease projected tribal harvest under Scenarios C or D significantly. Tribal harvest is predicted to decline by 56 to 58 percent and revenue by 3.4 to 4.1 percent under Alternative 2, Scenarios C or D because of the 30 percent decline in abundance in these two scenarios.

4.7.3 Alternative 3 – Escapement Goal Management at the Population Level

Scenario B

Under Alternative 3, Scenario B, overall tribal catch of salmon is predicted to be reduced by 85 percent compared to Alternative 1 – a loss of 1.6 million salmon each year (Table 4.7-9). Associated annual loss of direct tribal revenue from fish sales is estimated at $4.2 million.

Table 4.7-9. Estimated tribal salmon numbers harvested annually under Alternative 3, Scenario B.

Areas	Chinook	Coho	Sockeye	Pink	Chum	Steelhead
Strait of Juan de Fuca	0	1,725	0	0	2	610
North Puget Sound	0	143	0	0	1,057	227
South Puget Sound	22,738	72,889	0	316	81,163	653
Hood Canal	19,802	4,493	0	25,792	65,813	0
Full Action Area	42,540	79,250	0	26,108	148,035	1,490
Full Action Area – All Species						297,421

Principal predicted losses would be to tribal harvests of chinook salmon, down from 80,000 under Alternative 1 to 42,540 pieces, chiefly in North and South Puget Sound; coho down from 283,000 to 79,000 fish, chiefly from North and South Puget Sound; sockeye with 330,000 salmon lost from North and South Puget Sound; pink salmon in North Puget Sound, down to zero from 731,000 fish; and chum, down from 466,000 to 148,000, with all subareas adversely affected.

Alternative 3, Scenario B, would be more adverse than Alternative 2, Scenario B. It would significantly worsen the already adverse economic, health, and cultural circumstances experienced by the 17 tribes within the Puget Sound Action Area.

Summary of Results for Alternative 3, Scenarios A, C, or D

Predicted tribal harvests of chinook salmon under Alternative 1, Scenarios A, C, or D are presented in Table 4.7-10.

Table 4.7-10. Predicted tribal harvests of chinook salmon under Alternative 3, Scenarios A, C, or D.

Area/Element	Scenario A	Scenario C	Scenario D
Juan de Fuca Harvest (#)	0	0	0
North Puget Sound (#)	0	0	0
South Puget Sound (#)	24,150	11,523	10,537
Hood Canal (#)	21,213	12,745	11,608
Chinook Harvest – All Areas (#)	45,363	24,267	22,145
Chinook Revenue ($)	$355,519	$190,193	$173,555
Chinook salmon: Difference from Scenario B.	+2,822 chinook +$22,125	-18,273 chinook -$143,201	-20,395 chinook -$159,839

Predicted tribal harvests for Puget Sound coho, sockeye, pink, chum, and steelhead would remain unchanged between Scenarios A, C, or D, and Scenario B (Table 4.7-10). If Scenario A were implemented, tribal harvest under Alternative 3 would be predicted to increase by 2,822 chinook when compared with Scenario B. This would represent a 6.6 percent increase in chinook harvest, and a 0.2 percent increase in tribal harvest of all species taken together. Tribal fishing revenue under Alternative 1 would increase by $22,125 (0.4%), or $3 per capita. Predictably, assumption of 30 percent less harvest would decrease projected tribal harvest under Scenarios C or D significantly. Tribal harvest is predicted to decline by 43 to 48 percent, and revenue by 2.8 to 3.1 percent under Alternative 3, Scenarios C or D.

4.7.4 Alternative 4 – No Action/No Authorized Take, Scenario B.

Under Alternative 4, Scenario B, potential tribal harvests of four salmon species – chinook, coho, sockeye, and pink – are predicted to cease throughout the Puget Sound Action Area (Table 4.7-11). Potential tribal harvest of chum salmon is predicted to occur only in freshwater areas, principally in South Puget Sound, with small predicted catches in North Puget Sound and Hood Canal, and miniscule amounts predicted from Strait of Juan de Fuca streams. Total tribal chum salmon harvests are projected to decline by 92 percent under Alternative 4, from an estimated 466,000 fish under the Proposed Action (Alternative 1), to 37,800 fish.

Table 4.7-11. Estimated tribal salmon numbers harvested annually under Alternative 4, Scenario B.

Areas	Chinook	Coho	Sockeye	Pink	Chum	Steelhead
Juan de Fuca Strait	0	0	0	0	2	609
North Sound	0	0	0	0	1,057	227
South Sound	0	0	0	0	36,389	512
Hood Canal	0	0	0	0	352	0
Full Action Area	0	0	0	0	37,800	1,348
Full Action Area – All Species						39,148

Steelhead harvests by the tribes are predicted to decline by an estimated 30 percent, from 1,934 fish under Alternative 1, to 1,348 fish under Alternative 4. These catches would occur only in fresh water.

Summing lost tribal harvests for all salmonid species compared to baseline (Alternative 1) conditions, it is predicted that the tribes would lose almost 1.9 million salmon under Alternative 4, virtually eliminating access to the salmon resources reserved to them in the Stevens treaties. These impacts would, in turn, greatly diminish or eliminate the opportunity to pursue the occupation of tribal fisherman.

Other cultural opportunities to provide salmon as food, share or trade salmon within tribal communities, and conduct ceremonies would be eliminated or greatly reduced, and the physical and spiritual health of tribal peoples would be expected to decline.

The tribal peoples within the Puget Sound Action Area are already impoverished relative to residents of the State as a whole (Table 4.7-2). Using average fish size and prices for each species developed by Washington Department of Fish and Wildlife (2002), it is predicted that the subject tribes would receive approximately $107,000 from salmon sales under Alternative 4 – 2 percent of the revenues

predicted with Alternative 1. Additionally, tribal fishermen, with no marine areas to fish, would lose their investments in boats, gear, and – over time – their fishing knowledge, should these losses occur.

The projected adverse impacts identified here show that Alternative 4 is predicted to have the most disproportionately high and adverse human and/or environmental effects on the tribes of any alternative being considered, and would exacerbate existing adverse differences in economic well-being and health between the tribes and Washington State residents as a whole. The unique linkage between salmon and tribal culture/values renders these adverse differences between the well-being of the tribes and residents of the State of Washington in general more pronounced under Alternative 4 than the other alternatives under consideration.

Summary of Results for Alternative 4, Scenarios A, C, or D

Predicted tribal harvests of chinook salmon under Alternative 4, Scenarios A, C, or D are presented in Table 4.7-12. Chinook catch under all scenarios would be zero, since Alternative 4 is defined as no take of listed chinook salmon.

Table 4.7-12. Predicted tribal harvests of chinook salmon under Alternative 4, Scenarios A, C, or D.

Area/Element	Scenario A	Scenario C	Scenario D
Juan de Fuca Harvest (#)	0	0	0
North Puget Sound (#)	0	0	0
South Puget Sound (#)	0	0	0
Hood Canal (#)	0	0	0
Chinook Harvest – All Areas (#)	0	0	0
Chinook Revenue ($)	0	0	0
Chinook salmon: Difference from Scenario B.	--- ---	--- ---	--- ---

Predicted tribal harvests for Puget Sound coho, sockeye, pink, chum, and steelhead would remain unchanged between Scenarios A, C, or D, and Scenario B.

4.7.5 Comparison of the Effects of Management Alternatives on the Tribes

Table 4.7-13 summarizes the findings of this section – arrayed by Environmental Justice indicator. The comparison uses the results of Scenario B, but the results follow the same pattern regardless of which scenario is used.

Table 4.7-13. Summary of environmental justice indicators associated with potential impacts from alternative management plans under Scenario B. [1]

Tribal Indicator	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Number of Salmon Harvested	1,923,191	422,921	297,421	39,148
Cultural Viability	Maintains status quo. Not predicted to have high disproportionate or adverse impact.	Disproportionate and substantial adverse impact to: *Cultural sustainability. *Tribal identity. *Passing on tribal knowledge.	Disproportionate and substantial adverse impact to: *Cultural sustainability. *Tribal identity. *Passing on tribal knowledge.	Disproportionate and substantial adverse impact to: *Cultural sustainability. *Tribal identity. *Passing on tribal knowledge.
Catch Revenue	$5,131,930	$1,137,426	$925,339	$106,976
Per Capita Income*	No change	Minus $358 /person.	Minus $376 /person.	Minus $450/person.
Poverty	No change	Substantial and disproportionate increase.	Substantial and disproportionate increase.	Substantial and disproportionate increase.
Health/Mortality	Maintains status quo. Not predicted to have high disproportionate or adverse impact.	Disproportionately adverse to health.	Disproportionately adverse to health.	Disproportionate and substantial threat to health.

[1] Based on tribal population estimates in Table 4.7-2.

The alternatives considered in this Environmental Impact Statement balance issues of salmon harvest and non-harvest, each of which involves its own affected constituencies, among tribes, and within the Washington State population as a whole. The tribes considered here retained guaranteed access to salmon in their treaties – in order to allow them to sustain themselves and prosper. In treaty times, and today, salmon play a unique role for the tribes. The loss of salmon as a viable resource upon which the fishing tribes depend economically and culturally would be an irretrievable loss to tribal culture.

Notwithstanding treaty guarantees, the life of the tribal peoples subject to this impact analysis remains difficult, compared to non-tribal residents of the State. Poverty is unacceptably high. Incomes and health circumstances are adverse. Cultural viability is often threatened.

Salmon remain critically important as the tribes struggle to survive – providing food and badly needed economic returns, a continuing basis for culture and lifestyle, and hope of improvement for children and grandchildren in the future. Comparatively, on the non-tribal side, salmon are important to non-tribal commercial and sport fishermen – but within a context that is characterized by far more diversity

of economic opportunity, higher levels of material well-being, superior health and less direct cultural linkage with salmon for the majority of non-tribal citizens of Washington State.

Given this context, Table 4.7-13 and the preceding discussion identify that Alternatives 2, 3, or 4 would pose disproportionately-high and substantial adverse impacts to tribal culture, health and material well-being, differing only in degree. It is concluded that the severe potential impacts associated with any of these three alternatives render them unjust to the tribes when balanced against impacts to the people of Washington State as a whole. No mitigation measures have been identified that could effectively offset or reduce predicted Environmental Justice impacts to the tribes that would result from Alternative 2, Alternative 3, or Alternative 4.

4.7.6 Indirect and Cumulative Effects

4.7.6.1. Indirect Effects

Alternative 3 or 4 would specifically preclude fishing in marine areas. Alternative 2 would provide for only a modest marine chinook salmon fishery in North Puget Sound. In addition to direct harvest effects, these options could lead to increased crowding and/or competition between tribal fishers in some freshwater areas, and increased pressure on those freshwater stocks and on tribal fishing efficiencies.

The Samish and the Snoqualmie Tribes are afforded federal recognition, and demonstrate an historic fishing tradition. They are not presently recognized by the federal government to have status as treaty fishing tribes. Tribal spokespersons/experts report that a small number of their members have taken out non-tribal commercial salmon fishing licenses, but most of their salmon for ceremonies are currently obtained from one or more of the fishing tribes discussed in this Environmental Impact Statement. Consequently, Alternatives 2, 3, or 4 would not pose a present substantial threat with respect to material well-being or health for these tribes, but would make it more difficult for them to obtain salmon for ceremonial purposes and to continue cultural practices. As with other tribes, Alternative 1 would maintain current linkages between salmon and Samish and Snoqualmie peoples.

4.7.6.2 Cumulative Effects

NEPA defines cumulative effects as " . . . the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR1508.7). For purposes of this discussion, the terms "effects" and "impacts" will be considered

synonymously with "consequences," and consequences may be negative or beneficial. This subsection presents an analysis of the cumulative effects (negative or beneficial) of the Proposed Action in the context of other local, state, tribal, and federal management activities in the Puget Sound region on fish resources and related economic conditions.

The geographic scope of the cumulative effects analysis area includes the entire Puget Sound region. The analysis area covers both inland and marine environments that are managed under laws, policies, regulations, and plans having a direct or indirect impact on fish. The substantive scope of the cumulative effects analysis is predicated on a review of applicable laws, policies, regulations, and plans that specifically pertain to fish-related management activities, or that have an indirect negative or beneficial effect on fish resources and related economic conditions. These laws, policies, regulations, and plans are described in section 1 and Appendix F. Because of the geographic scope of the analysis area, it is not feasible to analyze all habitat-specific activities that are occurring, have occurred in the past, or will occur in the future in a quantitative manner. By reviewing applicable laws, policies, regulations, and plans, the analysis captures the objectives of management activities that are occurring or planned to occur that may interface with fish resources within the Puget Sound region. It is assumed that no management activity is occurring or would occur outside of an implemented law, policy, regulation, or sanctioned plan at the federal, tribal, state, or local level. Although the analysis is necessarily qualitative, it provides a thorough review of other activities within the region that, when combined with the Proposed Action, could have a negative or beneficial affect on environmental justice communities. Table 4.7-14 below summarizes the potential cumulative effects on environmental justice communities of other plans, policies and programs in the Puget Sound region in addition to the Proposed Action.

The Proposed Action (Alternative 1) is implementation of the Puget Sound Chinook Harvest Resource Management Plan (RMP), jointly prepared by the Washington Department of Fish and Wildlife (WDFW) and the Puget Sound Treaty Tribes (co-managers). Factors common to the relationship between the RMP and the various existing plans, policies and programs include: 1) the Resource Management Plan would provide protection to Puget Sound chinook salmon by conserving the productivity, abundance, and diversity of populations within the Puget Sound Chinook Evolutionarily Significant Unit (ESU), while managing harvest of strong salmon stocks; and 2) conserving productivity requires biological integrity in the freshwater systems in which salmon spawn and rear. Alternative 1 would maintain present-day distributions of salmon to the tribes, and is preferred. Due to alterations in habitat, stream water quality and other factors, the amount of salmon available to the

subject tribes is substantially less than at treaty times. Consequently, management of salmon harvests as described in Alternative 1 is necessary, but may not be sufficient, to deal with cumulative Environmental Justice concerns arising from other sources. Alternatives 2, 3, or 4 would substantially reduce tribal access to salmon fisheries, and therefore would significantly worsen tribal material and cultural circumstance.

Table 4.7-14. Federal, Tribal, Washington State, and local plans, policies, and programs predicted to have a cumulative impact on environmental justice communities within the Puget Sound Action Area (2004).

Federal/Tribal/State/Local		
Plans, Policies, and Programs (in chronological order of the earliest to the most recent)	Description and Intent	Cumulative Effect when Combined with the Proposed Action
U.S. v. Washington (Boldt Decision)	The Boldt Decision reaffirmed the rights of Washington Indian tribes to fish in accustomed places, and allocated 50 percent of the annual catch to treaty tribes. Judge Boldt held that the government's promise to secure the fisheries for the tribes was central to the treaty-making process, and that the tribes had an original right to the fish, which they extended to white settlers. Judge Boldt ordered the state to take action to limit fishing by non-Indians. The court decision recognized that "assuring proper spawning escapement is the basic element of conservation involved in restricting the harvest of salmon and Steelhead." The decision further defined adequate production escapement as "… that level of escapement from each fishery which will produce viable offspring in numbers to fully utilize all natural spawning grounds and propagation facilities reasonable and necessary for conservation of the resource…"	For treaty tribes considered as Environmental Justice communities, the legal mandates prescribed in U.S. v. Washington in conjunction with the Proposed Action would be predicted to result in a beneficial impact to Tribes considered to be Environmental Justice communities. Both the Proposed Action and U.S.v. Washington require that Tribes have access to fishery resources.
EPA Environmental Justice Policy under Executive Order 12898	The Executive Order requires that EPA maintain oversight responsibility on ensuring that federal agencies assess whether their actions may result in a disproportionate impact on environmental justice communities. Also, EPA oversees that other federal agencies strive to avoid disproportionate impacts when they are predicted to occur	In keeping with the intent of the Executive Order, it is predicted that the Proposed Action would not result in a cumulative or disproportionate impact to Environmental Justice communities.